

**DECLARATION BY DR. JUDITH ABRAHAM**

**EXHIBIT 2**

***Curriculum Vitae***

**Work Address:** Chiron Corporation  
4560 Horton Street, M/S 4.455  
Emeryville, CA 94608

**Home Address:** 4901 Country Lane  
San Jose, CA 95129

**Work Phone:** (510) 923-2457

**Work Fax:** (510) 923-5550

**E-mail:** judy\_abraham@chiron.com

**EDUCATION:**

<b>1971 - 1975</b>	University of California, Riverside, California B.A., Biology
<b>1975 - 1980</b>	University of California, Berkeley, California Ph.D., Molecular Biology (Thesis Advisor: Harrison Echols)

**EMPLOYMENT HISTORY:**

<b>1980 - 1983</b>	<b>Cold Spring Harbor Laboratory, Cold Spring Harbor, New York</b> <b><i>Postdoctoral Fellow</i></b> (Advisor: James Hicks)
<b>1983 - 2000</b>	<b>Scios Inc. / Scios Nova Inc. / California Biotechnology Inc.*</b>
<b>1983 - 1990</b>	<b><i>Staff Scientist</i></b>
1985 - 1989	FGF Project Leader (Research) / Manager (Development)
1989 - 1999	FGF Product Team Member (Clinical Testing Phase)
1988 - 1991	VEGF Project Leader
<b>1990 - 2000</b>	<b><i>Principal Scientist</i></b>
1990 - 1993	HB-EGF Project Leader
1994 - 1996	Mac-1 Project Leader
1997 - 2000	VEGF Project Leader (Research) / Manager (Development)
<b>2000 - present</b>	<b>Chiron Corporation</b>
<b>2000 - 2001</b>	<b><i>Associate Director, Research</i></b>
<b>2001 - present</b>	<b><i>Director, Research</i></b>

\* Scios Nova was formed through a merger of California Biotechnology and Nova Pharmaceutical Corp. in 1992; the name was subsequently shortened to Scios Inc.

**FELLOWSHIPS AND ACADEMIC HONORS:**

1975	Phi Beta Kappa, University of California, Riverside Chapter
1975	Summa Cum Laude Graduate, University of California, Riverside
1975	Outstanding Student Award, College of Natural and Agricultural Sciences, University of California, Riverside
1975 - 1976	Regents Fellowship, University of California, Berkeley
1976 - 1980	Regents Intern Fellowship, University of California, Berkeley
1981 - 1983	Damon Runyon - Walter Winchell Postdoctoral Fellowship

**MEMBERSHIPS AND SCIENTIFIC ORGANIZATION POSITIONS HELD:**

American Society for Investigative Pathology  
North American Vascular Biology Organization  
The Wound Healing Society  
*Board of Directors, 1996 – 1999*  
*Organizer, 1997 Annual Meeting*  
American Association for the Advancement of Science  
American Heart Association

## **PUBLICATIONS:**

1. **Abraham, J.A.**, D. Mascarenhas, R. Fischer, M. Benedik, A. Campbell, and H. Echols (1980) "DNA sequence of regulatory region for integration gene of bacteriophage lambda". *Proc. Natl. Acad. Sci. USA* **77**: 2477-2481.
2. **Abraham, J.A.**, and H. Echols (1981) "Regulation of int gene transcription by bacteriophage lambda: Location of the RNA start generated by an int constitutive mutation". *J. Mol. Biol.* **146**: 157-165.
3. Miller, H.I., **J.A. Abraham**, M. Benedik, A. Campbell, D. Court, H. Echols, R. Fischer, J.M. Galindo, G. Guarneros, T. Hernandez, D. Mascarenhas, C. Montanez, D. Schindler, U. Schmeissner, and L. Sosa (1981) "Regulation of the integration - excision reaction by bacteriophage lambda". *Cold Spring Harbor Symp. Quant. Biol.* **45**: 439-445.
4. Strathern, J.R., A.J.S. Klar, J.B. Hicks, **J.A. Abraham**, J.M. Ivy, K.A. Nasmyth, and C. McGill (1982) "Homothallic switching of yeast mating-type cassettes is initiated by a double-stranded cut in the MAT locus". *Cell* **31**: 183-192.
5. **Abraham, J.A.**, J. Feldman, K.A. Nasmyth, J.N. Strathern, A.J.S. Klar, J.R. Broach, and J.B. Hicks (1983) "Sites required for position-effect regulation of mating-type information in yeast". *Cold Spring Harbor Symp. Quant. Biol.* **47**: 989-998.
6. Broach, J.R., Y.-Y. Li, J. Feldman, M. Jayaram, **J. Abraham**, K.A. Nasmyth, and J.B. Hicks (1983) "Localization and sequence analysis of yeast origins of DNA replication". *Cold Spring Harbor Symp. Quant. Biol.* **47**: 1165-1173.
7. **Abraham, J.A.**, K.A. Nasmyth, J.N. Strathern, A.J.S. Klar, and J.B. Hicks (1984) "Regulation of mating-type information in yeast: Negative control requiring sequences both 5' and 3' to the regulated region". *J. Mol. Biol.* **176**: 307-331.
8. Klar, A.J.S., J.N. Strathern, and **J.A. Abraham** (1984) "Involvement of double-strand chromosomal breaks for mating-type switching in *Saccharomyces cerevisiae*". *Cold Spring Harbor Symp. Quant. Biol.* **49**: 77-88.
9. Brand, A.H., L. Breeden, **J. Abraham**, R. Sternglanz, and K. Nasmyth (1985) "Characterization of a "silencer" in yeast: A DNA sequence with properties opposite to those of a transcriptional enhancer". *Cell* **41**: 41-48.
10. Winoto, A., S. Chung, **J. Abraham**, and H. Echols (1986) "Directional control of site-specific recombination by bacteriophage lambda: Evidence that a binding site for Int protein far from the crossover point is required for integrative but not excisive recombination". *J. Mol. Biol.* **192**: 677-680.
11. Vlasuk, G.P., G.H. Bencen, R.M. Scarborough, P.-K. Tsai, J.L. Whang, T. Maack, M.J.F. Camargo, S.W. Kirsher, and **J.A. Abraham** (1986) "Expression and secretion of biologically active human atrial natriuretic peptide in *Saccharomyces cerevisiae*". *J. Biol. Chem.* **261**: 4789-4796.

12. **Abraham, J.A.**, A. Mergia, J.L. Whang, A. Tumolo, J. Friedman, K.A. Hjerrild, D. Gospodarowicz, and J.C. Fiddes (1986) "Nucleotide sequence of a bovine clone encoding the angiogenic protein, basic fibroblast growth factor". *Science* **233**: 545-548.
13. Mergia, A., R. Eddy, **J.A. Abraham**, J.C. Fiddes, and T.B. Shows (1986) "The genes for basic and acidic fibroblast growth factors are on different chromosomes". *Biochem. Biophys. Res. Commun.* **138**: 644-651.
14. **Abraham, J.A.**, J.L. Whang, A. Tumolo, A. Mergia, J. Friedman, D. Gospodarowicz, and J.C. Fiddes (1986) "Human basic fibroblast growth factor: Nucleotide sequence and genomic organization". *EMBO Journal* **5**: 2523-2528.
15. **Abraham, J.A.**, J.L. Whang, A. Tumolo, A. Mergia, and J.C. Fiddes (1986) "Human basic fibroblast growth factor: Nucleotide sequence, genomic organization, and expression in mammalian cells". *Cold Spring Harbor Symp. Quant. Biol.* **51**: 657-668.
16. Schweigerer, L., G. Neufeld, J. Friedman, **J.A. Abraham**, J.C. Fiddes, and D. Gospodarowicz (1987) "Capillary endothelial cells express basic fibroblast growth factor, a mitogen that stimulates their own growth". *Nature* **325**: 257-259.
17. Schweigerer, L., G. Neufeld, J. Friedman, **J.A. Abraham**, J.C. Fiddes, and D. Gospodarowicz (1987) "Basic fibroblast growth factor: Production and growth stimulation in cultured adrenal cortex cells". *Endocrinology* **120**: 796-800.
18. Schweigerer, L., G. Neufeld, A. Mergia, **J.A. Abraham**, J.C. Fiddes, and D. Gospodarowicz (1987) "Basic fibroblast growth factor in human rhabdomyosarcoma cells: Implications for the proliferation and neovascularization of myoblast-derived tumors". *Proc. Natl. Acad. Sci. USA* **84**: 842-846.
19. Fiddes, J.C., J.L. Whang, A. Mergia, A. Tumolo, and **J.A. Abraham** (1987) "Genes for the angiogenic growth factors, basic and acidic fibroblast growth factor". In: *Current Communications in Molecular Biology. Angiogenesis: Mechanisms and Pathobiology* (D.B. Rifkin and M. Klagsbrun, eds.). Cold Spring Harbor, New York, pp. 24-31.
20. Blam, S.B., R. Mitchell, E. Tischer, J.S. Rubin, M. Silva, S. Silver, J.C. Fiddes, **J.A. Abraham**, and S.A. Aaronson (1988) "Addition of growth hormone secretion signal to basic fibroblast growth factor results in cell transformation and secretion of aberrant forms of the protein". *Oncogene* **3**: 129-136.
21. Kimelman, D., **J.A. Abraham**, T. Haaparanta, T.M. Palisi, and M.W. Kirschner (1988) "The presence of fibroblast growth factor in the frog egg: Its role as a natural mesoderm inducer". *Science* **242**: 1053-1056.
22. Mergia, A., E. Tischer, D. Graves, A. Tumolo, J. Miller, D. Gospodarowicz, **J.A. Abraham**, G.D. Shipley, and J.C. Fiddes (1989) "Structural analysis of the gene for human acidic fibroblast growth factor". *Biochem. Biophys. Res. Commun.* **164**: 1121-1129.

23. Gospodarowicz, D., **J.A. Abraham**, and J. Schilling (1989) "Isolation and characterization of a vascular endothelial cell mitogen produced by pituitary-derived folliculo stellate cells". *Proc. Natl. Acad. Sci. USA* **86**: 7311-7315.
24. Tischer, E., D. Gospodarowicz, R. Mitchell, M. Silva, J. Schilling, K. Lau, T. Crisp, J.C. Fiddes, and **J.A. Abraham** (1989) "Vascular endothelial growth factor: A new member of the platelet-derived growth factor gene family". *Biochem. Biophys. Res. Commun.* **165**: 1198-1206.
25. Thompson, S.A., A.A. Protter, L. Bitting, J.C. Fiddes, and **J.A. Abraham** (1990) "Cloning, recombinant expression, and characterization of basic fibroblast growth factor". *Methods Enzymol.* **198**: 96-116.
26. Hebda, P.A., C.K. Klingbeil, **J.A. Abraham**, and J.C. Fiddes (1990) "Basic fibroblast growth factor stimulation of epidermal wound healing in pigs". *J. Invest. Dermatol.* **95**: 626-631.
27. Fiddes, J.C., P.A. Hebda, P. Hayward, M.C. Robson, **J.A. Abraham**, and C.K. Klingbeil (1991) "Preclinical wound-healing studies with recombinant human basic fibroblast growth factor". In: *Annals of the New York Academy of Sciences, Volume 638: The Fibroblast Growth Factor Family*, pp. 316-328.
28. Higashiyama, S., **J.A. Abraham**, J. Miller, J.C. Fiddes, and M. Klagsbrun (1991) "A heparin-binding growth factor secreted by macrophage-like cells that is related to EGF". *Science* **251**: 936-939.
29. Tischer, E., R. Mitchell, T. Hartman, M. Silva, D. Gospodarowicz, J.C. Fiddes, and **J.A. Abraham** (1991) "The human gene for vascular endothelial growth factor: Multiple protein forms are encoded through alternative exon splicing". *J. Biol. Chem.* **266**: 11947-11954.
30. Higashiyama, S., K. Lau, G.E. Besner, **J.A. Abraham**, and M. Klagsbrun (1992) "Structure of heparin-binding EGF-like growth factor: Multiple forms, primary structure, and glycosylation of the mature protein". *J. Biol. Chem.* **267**: 6205-6212.
31. **Abraham, J.A.**, D. Damm, A. Bajardi, J. Miller, M. Klagsbrun, and R.A.B. Ezekowitz (1993) "Heparin-binding EGF-like growth factor: Characterization of rat and mouse cDNA clones, protein domain conservation across species, and transcript expression in tissues". *Biochem. Biophys. Res. Commun.* **190**: 125-133.
32. Higashiyama, S., **J.A. Abraham**, and M. Klagsbrun (1993) "Heparin-binding EGF-like growth factor stimulation of smooth muscle cell migration: Dependence on interactions with cell surface heparan sulfate". *J. Cell Biol.* **122**: 933-940.
33. Marikovsky, M., K. Breuing, P.Y. Liu, E. Eriksson, S. Higashiyama, P. Farber, **J. Abraham**, and M. Klagsbrun (1993) "Appearance of heparin-binding EGF-like growth factor in wound fluid as a response to injury". *Proc. Natl. Acad. Sci. USA* **90**: 3889-3893.

34. Powell, P.P., M. Klagsbrun, **J.A. Abraham**, and R.C. Jones (1993) "Eosinophils expressing heparin-binding EGF-like growth factor mRNA localize around lung microvessels in pulmonary hypertension." *Am. J. Pathol.* **193**: 1-10.
35. Dluz, S.M., S. Higashiyama, D. Damm, **J.A. Abraham**, and M. Klagsbrun (1993) "Heparin-binding epidermal growth factor-like growth factor expression in cultured fetal human vascular smooth muscle cells: Induction of mRNA levels and secretion of active mitogen". *J. Biol. Chem.* **268**: 18330-18334.
36. Nakano, T., E.W. Raines, **J.A. Abraham**, F.G. Wenzel IV, S. Higashiyama, M. Klagsbrun, and R. Ross (1993) "Glucocorticoid inhibits thrombin-induced expression of platelet-derived growth factor A-chain and heparin-binding EGF-like growth factor in human aortic smooth muscle cells". *J. Biol. Chem.* **268**: 22941-22947.
37. Thompson, S.A., S. Higashiyama, K. Wood, N.S. Pollitt, D. Damm, G. McEnroe, B. Garrick, N. Ashton, K. Lau, N. Hancock, M. Klagsbrun, and **J.A. Abraham** (1994) "Characterization of sequences within heparin-binding EGF-like growth factor that mediate interaction with heparin". *J. Biol. Chem.* **269**: 2541-2549.
38. Ito, N., S. Kawata, S. Tamura, S. Kiso, H. Tsushima, D. Damm, **J.A. Abraham**, S. Higashiyama, N. Taniguchi, and Y. Matsuzawa (1994) "Heparin-binding EGF-like growth factor is a potent mitogen for rat hepatocytes". *Biochem. Biophys. Res. Commun.* **198**: 25-31.
39. Nakano, T., E.W. Raines, **J.A. Abraham**, M. Klagsbrun, and R. Ross (1994) "Lysophosphatidylcholine upregulates the level of heparin-binding epidermal growth factor-like growth factor mRNA in human monocytes". *Proc. Natl. Acad. Sci. USA* **91**: 1069-1073.
40. Avraham, H., N. Banu, D.T. Scadden, **J. Abraham**, and J.E. Groopman (1994) "Modulation of megakaryocytopoiesis by human basic fibroblast growth factor". *Blood* **83**: 2126-2132.
41. Das, S.K., X.-N. Wang, B.C. Paria, D. Damm, **J.A. Abraham**, M. Klagsbrun, G.K. Andrews, and S.K. Dey (1994) "Heparin-binding EGF-like growth factor gene is induced in the mouse uterus temporally by the blastocyst solely at the site of its apposition: A possible ligand for interaction with blastocyst EGF receptor in implantation". *Development* **120**: 1071-1083.
42. Wang, X.-N., S.K. Das, D. Damm, M. Klagsbrun, **J.A. Abraham**, and S.K. Dey (1994) "Differential regulation of heparin-binding EGF-like growth factor in the adult ovariectomized mouse uterus by progesterone and estrogen". *Endocrinology* **135**: 1264-1271.
43. Raab, G., S. Higashiyama, S. Hetelekidis, **J.A. Abraham**, D. Damm, M. Ono, and M. Klagsbrun (1994) "Biosynthesis and processing by phorbol ester of the cell surface-associated precursor form of heparin-binding EGF-like growth factor". *Biochem. Biophys. Res. Commun.* **204**: 592-597.

44. Ono, M., G. Raab, K. Lau, **J.A. Abraham**, and M. Klagsbrun (1994) "Purification and characterization of transmembrane forms of heparin-binding EGF-like growth factor". *Proc. Natl. Acad. Sci. USA* **269**: 31315-31321.
45. Cook, P.W., D. Damm, B.L. Garrick, K.M. Wood, C.E. Karkaria, S. Higashiyama, M. Klagsbrun, and **J.A. Abraham** (1995) "Carboxyl-terminal truncation of leucine<sup>76</sup> converts heparin-binding EGF-like growth factor from a heparin-enhancible to a heparin-suppressible growth factor". *J. Cell. Physiol.* **163**: 407-417.
46. Berardi, A.C., A. Wang, **J. Abraham**, and D.T. Scadden (1995) "Basic fibroblast growth factor mediates its effects on committed myeloid progenitors by direct action and has no effect on hematopoietic stem cells". *Blood* **86**: 2123-2129.
47. Faber-Elman, A., A. Solomon, **J.A. Abraham**, M. Marikovsky, and M. Schwartz (1996) "Involvement of wound-associated factors in rat brain astrocyte migratory response to axonal injury: in vitro simulation". *J. Clin. Invest.* **97**: 162-171.
48. McCarthy, S.A., M.L. Samuels, C.A. Pritchard, **J.A. Abraham**, and M. McMahon (1995) "Rapid induction of heparin-binding epidermal growth factor / diphtheria toxin receptor expression by Raf and Ras oncogenes". *Genes & Development* **9**: 1953-1964.
49. **Abraham, J.A.**, and M. Klagsbrun (1995) "Modulation of wound repair by members of the fibroblast growth factor family". In: *The Molecular and Cellular Biology of Wound Repair* (Second Edition), (Richard A. F. Clark, editor), pp. 195-248, Plenum Publishing Co., New York.
50. Leslie, C.C., K. McCormick-Shannon, J. M. Shannon, B. Garrick, D. Damm, **J.A. Abraham**, and R.J. Mason (1997) "Heparin-binding EGF-like growth factor is a mitogen for rat alveolar type II cells". *Am. J. Resp. Cell Mol. Biol.* **16**: 379 - 387.
51. Sakai, M., M. Zhang, T. Homma, B. Garrick, **J.A. Abraham**, J.A. McKanna, and R.C. Harris (1997) "Production of heparin-binding epidermal growth factor-like growth factor in the early phase of regeneration after acute renal injury. Isolation and localization of bioactive molecules". *J. Clin. Invest.* **99**: 2128 - 2138.
52. Abramovitch, R., M. Neeman, R. Reich, I Stein, E. Keshet, **J. Abraham**, A. Solomon, and M. Marikovsky (1998) "Intercellular communication between vascular smooth muscle and endothelial cells mediated by heparin-binding epidermal growth factor-like growth factor and vascular endothelial growth factor". *FEBS Lett.* **425**: 441 - 447.
53. Feng, Y., D. Chung, L. Garrard, G. McEnroe, D. Lim, J. Scardina, K. McFadden, A. Guzzetta, A. Lam, **J. Abraham**, D. Liu, and G. Endemann (1998) "Peptides derived from the complementarity-determining regions of anti-Mac-1 antibodies block intercellular adhesion molecule-1 interaction with Mac-1". *J. Biol. Chem.* **273**: 5625-5630.
54. Feng, L., G.E. Garcia, Y. Yang, Y. Xia, F.B. Gabbai, O.W. Peterson, **J.A. Abraham**, R.C. Blantz, and C.B. Wilson (2000) "Heparin-binding EGF-like growth factor contributes to reduced glomerular filtration rate during glomerulonephritis in rats". *J. Clin. Invest.* **105**: 341-350.

55. Kalmes, A., B.R. Vesti, G. Daum, **J.A. Abraham**, and A.W. Clowes (2000) "Heparin blockade of thrombin-induced smooth muscle cell migration involves inhibition of epidermal growth factor (EGF) receptor transactivation by heparin-binding EGF-like growth factor". *Circ. Res.* **87**: 92-98.
56. Henson, M., D. Damm, A. Lam, L.J. Garrard, T. White, **J.A. Abraham**, G.F. Schreiner, L.W. Stanton, and A.H. Joly (2000) "Insulin-like growth factor-binding protein-3 induces fetalization in neonatal rat cardiomyocytes". *DNA and Cell Biol.* **19**: 757-763.
57. Chen, M.M., A. Lam, **J.A. Abraham**, G.F. Schreiner, and A.H. Joly (2000) "CTGF expression is induced by TGF- $\beta$  in cardiac fibroblasts and cardiac myocytes: a potential role in heart fibrosis". *J. Mol. Cell. Cardiol.* **32**:1805-1819.
58. Yang, H.T., Z. Yan, **J.A. Abraham**, and R.L. Terjung (2001) "VEGF<sub>121</sub>- and bFGF-induced increase in collateral blood flow requires normal nitric oxide production". *Am. J. Physiol. Heart Circ. Physiol.* **280**: H1097-H1104.
59. Suga, S., Y.-G. Kim, A. Joly, E. Puchacz, D.-H. Kang, J.A. Jefferson, **J.A. Abraham**, J. Hughes, R.J. Johnson, and G.F. Schreiner (2001) "Vascular endothelial growth factor (VEGF<sub>121</sub>) protects rats from renal infarction in thrombotic microangiopathy". *Kidney International* **60**: 1297-1308.
60. Villanueva, F.S., **J.A. Abraham**, G.F. Schreiner, M. Csikari, D. Fischer, J.D. Mills, U. Schellenberger, B.J. Koci, and J.S. Lee (2002) "Myocardial contrast echocardiography can be used to assess the microvascular response to vascular endothelial growth factor-121". *Circulation* **105**: 759-765.